CANADA DEPARTMENT OF AGRICULTURE / MINISTÈRE DE L'AGRICULTURE DU C...

HEALTH OF ANIMALS BRANCH / DIRECTION DE L'HYGIÈNE VÉTÉRI...
Animal Diseases Research Institute
P.O. Box 1400, Hull, Que.

Major J.C. Howard,
Director of Electronic Warfare,
Canadian Forces HQ,
Ottawa, Ontario.
K1A 0K2.

YOUR FILE NO.
VOTRE RÉF. N°

OUR FILE NO.
NOTRE RÉF. N°

1920

March 8, 1972

Re: Fibreglass Chaff Testing

Dear Major Howard:

Your memo of November 1st, 1971 and the 20 lbs of the above mentioned material is acknowledged.

As requested, a series of experiments were set up to ascertain whether the material in question was toxic in any way or, following ingestion, could in fact be sufficiently irritant to cause pathological changes either in the alimentary tract or in other major organs of cattle.

I have attached a copy of our Project Outline (AP 716) giving the experiment detail as well as a Progress Report outlining the results.

It will be seen from the conclusions on page 2 of the report that the chaff failed to produce harmful effects and that we do not feel further work is necessary.

If you concur with our findings and conclusions in that further work is not essential, I would appreciate knowing whether you wish to have the remaining chaff returned.

Yours very truly,

R.J. Avery,
Director,
Animal Diseases Research Institute.

RJA:sp
Attach.

cc: Dr. A.H. Corner

Project Outline

D.E.W. Project 71W210 - Animal Pathology

Title: The ingestion of fibreglass chaff by cattle.

Objectives: To study and record the effects on cattle fed aluminium-coated fibreglass chaff.

Scientists: B.B. Barrett and R.R.MacKay.

Man Years: Scientist: 0.125 Technician: 0.02

Date Submitted: November 15, 1971.

Date Approved: 2 December 1971.

Reporter: R.R. MacKay.

Preliminary Study

As an initial experiment, attempts will be made to ascertain the palatability of this material when added to calf rations.

In view of the circumstances where cattle at pasture can encounter this material in undispersed amounts of about 0.5 ozs. it is proposed to feed the following:

1. Present a lump of about 0.5 oz of this material to a hungry calf.
2. If this calf does not eat it, 0.5 oz of this material will then be presented to a hungry calf, after being well mixed throughout its daily ration of meal (about 3 lbs.).
3. 0.5 ozs. will also be well mixed throughout one day's ration of hay, and fed to another hungry calf.

This should establish if this material is palatable.

If it is not palatable it is planned to formulate a preparation as a bolus with meal and molasses, or in a gelatin capsule for administration by balling-gun. As a last resort a stomach tube will be used to administer the material.

Depending upon the results obtained above, a controlled trial will then be set up as follows:

Six calves will be used in the trial. These will include the 2 calves already used for palatability studies. The calves will be divided into 3 groups as follows:

Group A The 2 calves already used in the preliminary tests will each be fed 0.25 ozs. (7.0 grams) fibreglass chaff in their daily ration of hay over a period of 2 weeks.*

Group B 3 calves will each be fed 0.125 ozs. (3.5 grams) of fibreglass chaff in their daily ration of meal (3 lbs.) for a period of 2 weeks.*

Group C Controls - 1 calf will receive the same rations without fibreglass chaff.

* The feeding of fibreglass chaff will be terminated before the end of the projected period if severe digestive disturbances are produced; or, it may be extended if no adverse effects are manifest.

Mixing

The dose will be thoroughly mixed in about 1 lb. of meal or hay as a premix before being distributed evenly throughout the daily ration.

Clinical Examination

All 6 calves will be tied by the neck in stalls. They will be given a pretest period of a few days on their normal ration as an aclimatization period before the trial begins. A hemogram will be obtained for each animal before the trial and towards the end of the trial. Other ancilliary tests will be performed as required depending upon the symptoms illicited.

All animals will be examined clinically every morning and afternoon, with special attention to any digestive disturbances present. Feeding of medicated rations will take place in the morning to allow better clinical observations to be made.

Pathology

All test animals will be slaughtered at the termination of the test and a complete P.M. performed. Histological examination of all levels of the digestive tract, trachea, lungs, liver and kidneys will be performed. In addition, fibreglass chaff will be introduced into lung, and intestinal tissues and agar and these preparations will be processed and sectioned for examination for comparative purposes.

Further Studies

Depending upon the results of the above trial it may be necessary to do chronic toxicity tests, e.g. intermittent feeding of fibreglass chaff over a much longer period (say 6 months). On the other hand if no adverse effects are produced by this trial it seems reasonable to assume that under existing field conditions this material would be relatively harmless.

D.E.W. Project 71W210 - Animal Pathology

Title:	The ingestion of fibreglass chaff by cattle.
Objectives:	To study and record the effects on cattle fed aluminium-coated fibreglass chaff.
Scientists:	B.B. Barrett and R.R.MacKay
Man Years:	Scientist: 0.125 Technician: 0.02
Date Submitted:	November 15, 1971.
Date Approved:	December 2, 1971.
Reporter:	R.R. MacKay.
Date of Present Report:	February 18, 1972.

PROGRESS REPORT #1 (FINAL)

RESULTS OF FEEDING TRIALS

Preliminary Studies

It was established that this material was rejected by hungry calves when presented to them in a clump of approximately 0.5 ozs. in weight. When the material was scattered among their daily ration of dry meal it was also very largely rejected by the calves. To ensure ingestion of the material it was scattered evenly over their daily ration of meal and molasses was then poured over it. The whole preparation was then mixed thoroughly by hand. Calves consumed this formulation very readily and it was decided to employ this method of administration throughout the following trials.

Feeding Trials

Group A consisted of 2 male calves of approximately 400 lbs live weight. They were fed 0.25 ozs. of fibreglass chaff every morning, as above, for a total of 14 consecutive days. No evidence of digestive disturbance or other clinical symptoms were observed throughout the trial. The calves appeared to gain in

condition at the same rate as the 4 calves on normal rations. Blood samples take the start and end of the trial showed no deviation from normal. Post-mortem examination of both calves killed on the 14th day of the trial showed no lesions of pathological significance which could be attributed to the fibreglass chaff. Detailed histological examination of sections representative of the entire digest system and major organs including brain, showed no lesions of pathological significance. A few small fragments of the material were found trapped between the keratinized villi of the reticulum. These fragments of fibreglass chaff did not appear to provoke any cellular reaction to their presence.

Group B consisted of 3 male calves of approximately 400 lbs live weight that were fed a daily ration of 0.125 ozs. fibreglass chaff as previously described for Group A, for periods of 25, 35 and 39 consecutive days respectively when they were slaughtered and examined as above.

Blood, clinical, post-mortem and histopathological examinations all gave negative results for significant pathological changes. The three calves continue to gain at the same rate as the control calf.

Comments and Conclusions

The dose rates and exposure times employed in the trials were designed to adequately simulate the risk of very heavy exposure in the field to this material.

Under the conditions employed fibreglass chaff failed to produce harmful effects on cattle. Under the circumstances long-term chronic toxicity studies do not seem warranted.